

WHAT IS CLAIMED IS:

1. An image reader comprising:

a CCD sensor for converting an image of an object to be read to image data of electrical signals;

5 a transparent glass for holding the object to be read;

a mirror set includes one or more mirrors, and is able to move along the transparent glass, for transmitting the image of the object to be read to the
10 CCD sensor;

an illuminating device is moved along the transparent glass together with the mirror set and illuminates the object to be read held to the transparent glass;

15 a carriage member for supporting the mirror set and the illuminating device, which moves at a specified speed along the transparent glass by external driving force, and for indicating an own position by a marker member mounted on its own specified position;

20 a white reference provider for providing white reflected light that serves as a reference for defining a threshold level when the CCD sensor outputs the image data;

25 a home position sensor for detecting the marker member of the carriage member and setting the wait position of the mirror set and the illuminating device;

a reading window that is arranged at a specified

position in a direction away from the transparent glass with the white reference provider set at the center in a plane defined by the white reference provider as well as the transparent glass and enables the image of the object to be read to be transmitted to the CCD sensor through the mirror set by feeding of the object to be read independently from the object to be read set on the transparent glass; and

a drive unit for moving the carriage member at a predetermined speed and setting the position of the carriage member in such a manner that, at the wait time, the reflected light from the white reference provider is guided to the mirror of the mirror set supported on the carriage member, to which the reflected light from the object to be read is first transmitted.

2. The image reader according to claim 1, wherein the drive unit moves the carriage member towards the transparent glass while the white reference provider is being illuminated by the illuminating device when reading of the image of the object to be read set on the transparent glass is instructed.

3. The image reader according to claim 1, wherein the drive unit moves the carriage member towards the reading window while the white reference provider is being illuminated by the illuminating device when reading of the image of the object to be read set on the transparent glass is instructed.

4. The image reader according to claim 2, wherein the drive unit accelerates a traveling speed of the carriage member to a specified speed while the carriage member reaches the head end of the transparent glass.

5 5. The image reader according to claim 4, wherein the drive unit accelerates the traveling speed of the carriage member at a specified acceleration while the reflected light from the white reference provider is being transmitted to the mirror to which the reflected
10 light from the object to be read is first transmitted of the mirror set.

 6. The image reader according to claim 3, wherein the drive unit accelerates the traveling speed of the carriage member at a specified acceleration while the
15 reflected light from the white reference provider is being transmitted to the mirror to which the reflected light from the object to be read is first transmitted of the mirror set, and stops the travel of the carriage member at the position where the specified position of
20 the reading window faces the specified position of the mirror to which the reflected light is first transmitted.

 7. An image reader comprising:
 a CCD sensor for converting an image of the object
25 to be read to the image data of electrical signals;
 a transparent glass for holding the object to be read;

a mirror set includes one or more mirrors, and is able to move along the transparent glass, for transmitting the image of the object to be read to the CCD sensor;

5 an illuminating device is moved along the transparent glass together with the mirror set and illuminates the object to be read held to the transparent glass;

10 a carriage member for supporting the mirror set and the illuminating device, which moves at a specified speed along the transparent glass by the external driving force, for indicating an own position by a marker member mounted on its own specified position;

15 a white reference provider for providing the white reflected light that serves as a reference for defining the threshold level when the CCD sensor outputs the image data;

20 a home position sensor for detecting the marker member of the carriage member and setting the wait position of the mirror set and the illuminating device;

25 a reading window that is arranged at a specified position in the direction away from the transparent glass with the white reference provider set at the center in a plane defined by the white reference provider as well as the transparent glass and enables the image of the object to be read to be transmitted to the CCD sensor through the mirror set by feeding of the

object to be read independently from the object to be read set on the transparent glass; and

5 a drive unit for moving the carriage member at a specified speed in the section opposite to the transparent glass, and at the wait time, setting the position of the carriage member in such a manner that the reflected light from the white reference provider is guided to the mirror, to which the reflected light from the object to be read of one or more mirrors of the mirror set supported on the carriage member is first transmitted, and moving the carriage member towards the transparent glass side and accelerating the carriage member to the specified speed until the carriage member faces opposite to the transparent glass head end when the instruction is given to read the image of the object to be read set on the transparent glass, and driving the carriage member to the reading window, that is, towards the direction opposite to the transparent glass and stopping the carriage member at the position opposite to the reading window.

8. The image reader according to claim 7, further comprising:

25 a timing change circuit, that can change the timing for the CCD sensor to photoelectrically convert and output the reflected light from the white reference provider entered into the CCD sensor:

wherein the timing change circuit synchronizes the

timing for the CCD sensor to photoelectrically convert the reflected light from the white reference provider with the specified time set as a unit, every time the speed when the carriage member is moved opposite to the white reference provider.

9. The image reader according to claim 8, wherein the traveling speed of the carriage member is changed with the specified time used as a unit is stored in memory in advance.

10. The image reader according to claim 8, wherein the output timing for the CCD sensor to photoelectrically convert and output the reflected light from the white reference provider is such that the cycle time of horizontal synchronizing signal H-SYNC is set to be same as the time for reading the reading width per one line that corresponds to the reading resolution or the reading magnification while the carriage member travel speed is being accelerated only.

11. A method for driving an image reader that guides the reflected light from the white reference provider to the mirror of one or more mirrors of the image reader to which the reflected light from the object to be read is first transmitted and defines the threshold level comprising the steps of:

moving the mirror set that can transmit the reflected light from the band-form region illuminated

by the illuminating device that can provide a band-form
illuminated light extended in the first direction and
having the specified length in the second direction
intersecting to the first direction by the use of the
5 mirror set with a plurality of mirrors extended in the
first direction and having a specified length in the
second direction as well as the carriage member
containing the illuminating device along the image of
the object to be read,

10 moving the carriage member at the wait time in
such a manner that the rough center of the mirror in
the second direction to which the reflected light is
first transmitted from the object to be read of the
mirror set is opposite to the rough center of the white
15 reference provider in the second direction for
providing the white reflected light that serves as the
reference to define the threshold level for CCD sensor
to output the image data, and moving the carriage
member at a specified speed in the section opposite to
20 the transparent glass,

moving the carriage member towards the transparent
glass side and accelerating the carriage member to the
specified speed until the carriage member becomes
opposite to the transparent glass head end when the
25 instruction is given to read the image of the object to
be read set to the transparent glass, and

driving the carriage member towards the reading

window and stopping the carriage member at the position opposite to the reading window when the instruction is given to read the image of the object to be read conveyed to the reading window.

5 12. The method for driving an image reader that guides the reflected light from the white reference provider to the mirror of one or more mirrors of the image reader to which the reflected light from the object to be read is first transmitted and defines the
10 threshold level according to claim 11:

 wherein the timing for the CCD sensor to photoelectrically converting and outputting the reflected light from the white reference provider is synchronized with the specified time used as the unit
15 every time the traveling speed when the carriage member is moved opposite to the white reference provider is changed with the specified time used as the unit, using the timing changing circuit that can change the timing for the CCD sensor to photoelectrically convert and
20 output the reflected light from the white reference provider.

 13. The method for driving an image reader that guides the reflected light from the white reference provider to the mirror of one or more mirrors of the
25 image reader to which the reflected light from the object to be read is first transmitted and defines the threshold level according to claim 11:

wherein the output timing for the CCD sensor to photoelectrically convert and output the reflected light from the white reference provider is such that the cycle time of horizontal synchronizing signal H-SYNC is set to be same as the time for reading the
5 reading width per one line that corresponds to the reading resolution or the reading magnification while the traveling speed of the carriage member is being accelerated only.